

# Supplementary Information for The Role of Calcium Oscillations in the Phenotype Selection in Endothelial Cells

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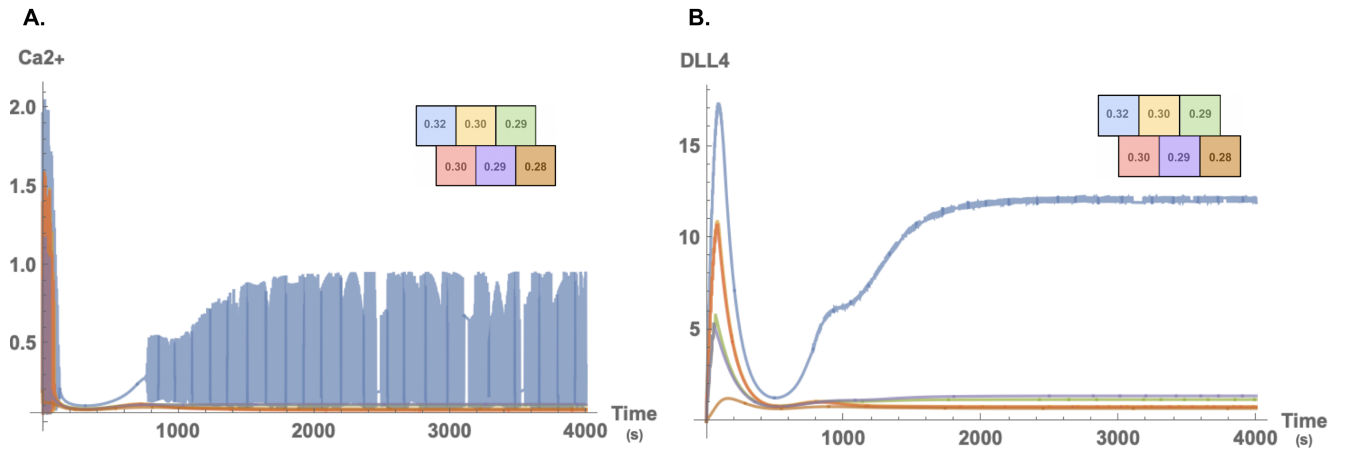
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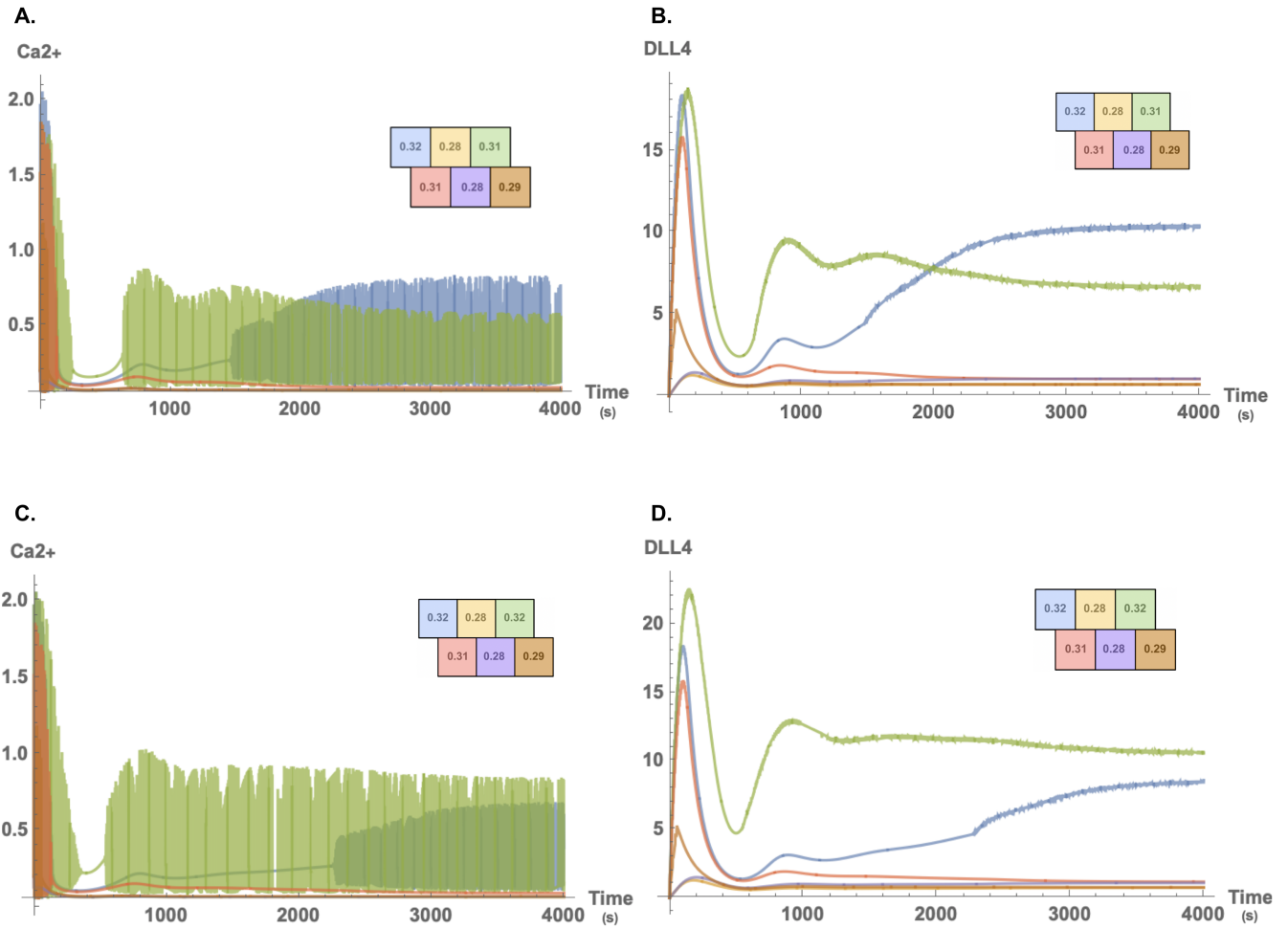
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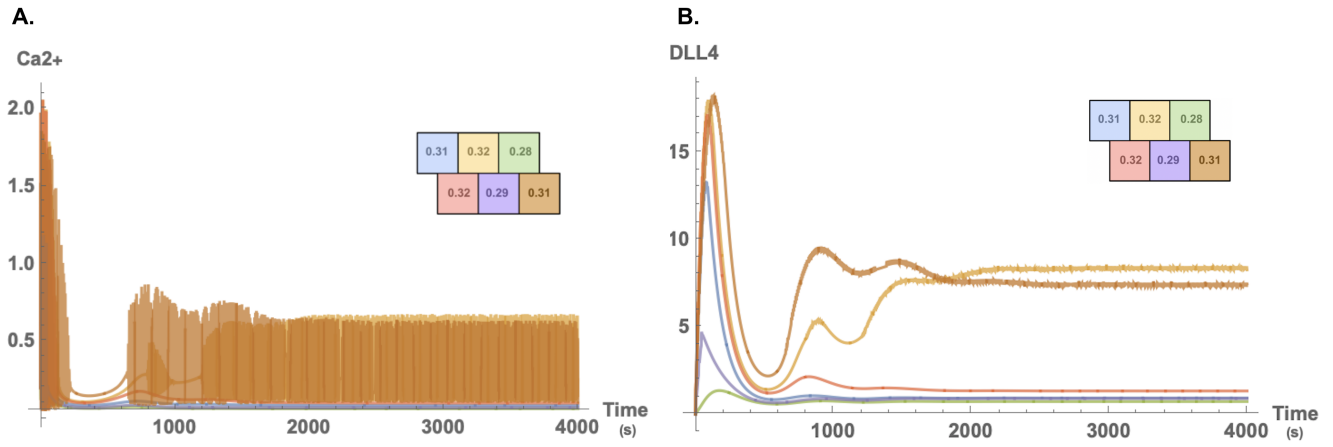
## Calcium and DLL4 Dynamics of All Cells



**Figure 1.** Example simulation for decreasing gradient  $\mu$ . **(A)** Late calcium oscillations are observed initially in the cell having the highest concentration,  $\mu = 0.32$ . **(B)** DLL4 concentrations reaching a plateau around  $t=1800$ .

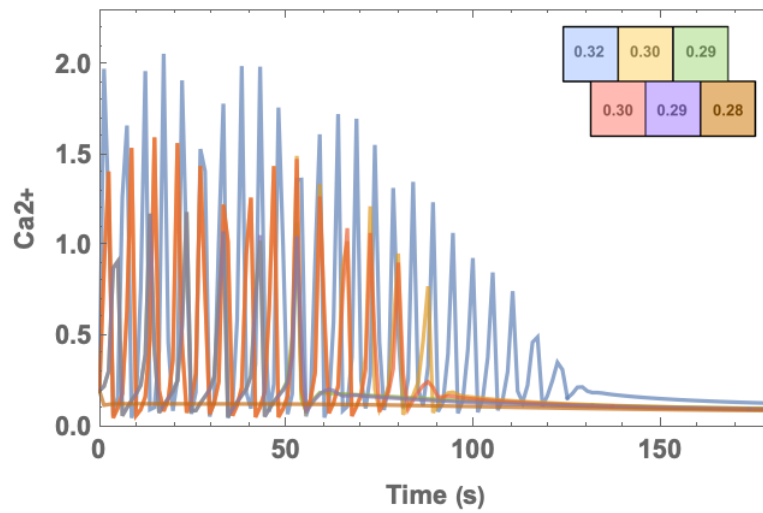


**Figure 2.** Example scenario in comparison of  $\mu$  levels. **(A)** Cells containing high  $\mu$  levels (green and blue) continued to oscillate. The cell with the highest concentration is shown to begin oscillating in a later time with lower  $\text{Ca}^{2+}$  levels. Although having the same amount of  $\mu$ , the 4th cell (pink) doesn't possess continual oscillations as in the green cell. **(B)** The late DLL4 concentrations are higher in the blue cell relative to the green. However it is shown to increase later in accordance with late initiation of  $\text{Ca}^{2+}$  oscillation. **(C)** The concentration in the green cell is increased and it is shown to influence the timing for blue cells secondary  $\text{Ca}^{2+}$  oscillation phase. **(D)** DLL4 concentrations for the case where the blue and the green cells contain the same amount of  $\mu$ . It can be seen that the blue cell has lower DLL4 level for late times.

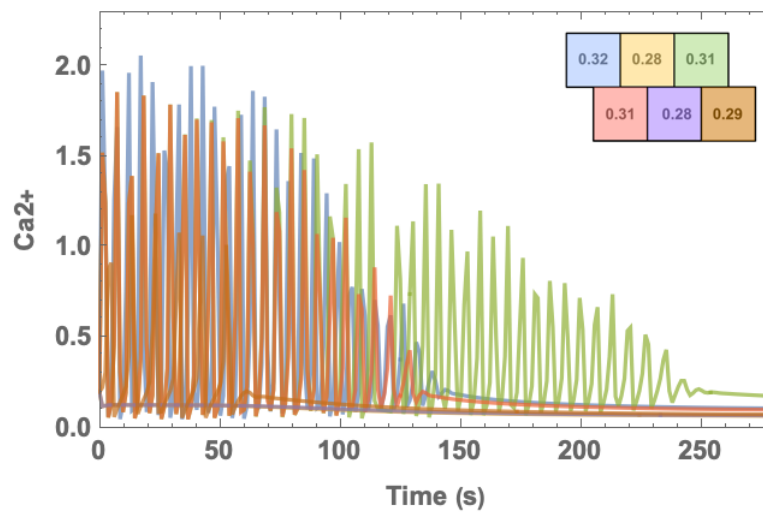


**Figure 3.** Example scenario where two high  $\mu$  cell yellow and pink are neighbours. **(A)** Calcium oscillates for yellow and orange cells. One of the cells having the highest  $\mu$  concentration doesn't regain its oscillations. **(B)** It can be seen from DLL4 concentrations is that the pink cell (the cell with stalk phenotype despite the high VEGF intake) increased to similar DLL4 levels with the yellow cell, yet unable to re-increase the concentration. However, the yellow cell whose neighbours have lower VEGF intake and consequently lower IP3 levels is shown to increase DLL4 levels in the secondary phase. Also, the late DLL4 levels are higher for the yellow cell than of orange cell.

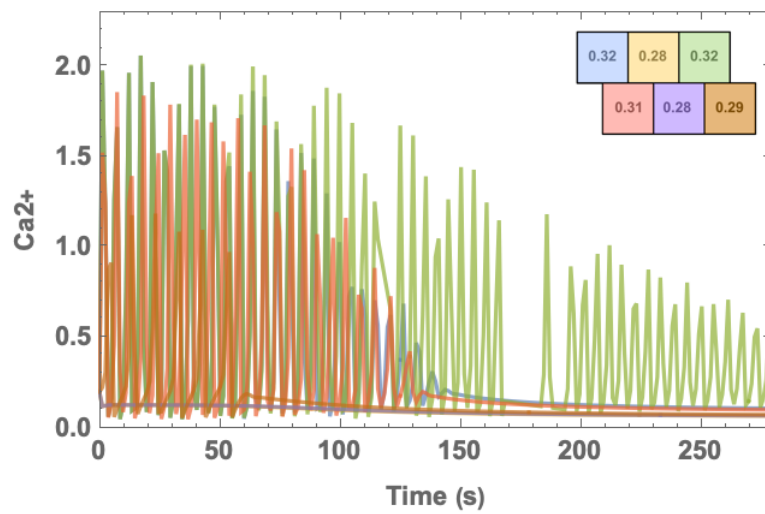
## Pre-cessation Calcium Dynamics of All Cells



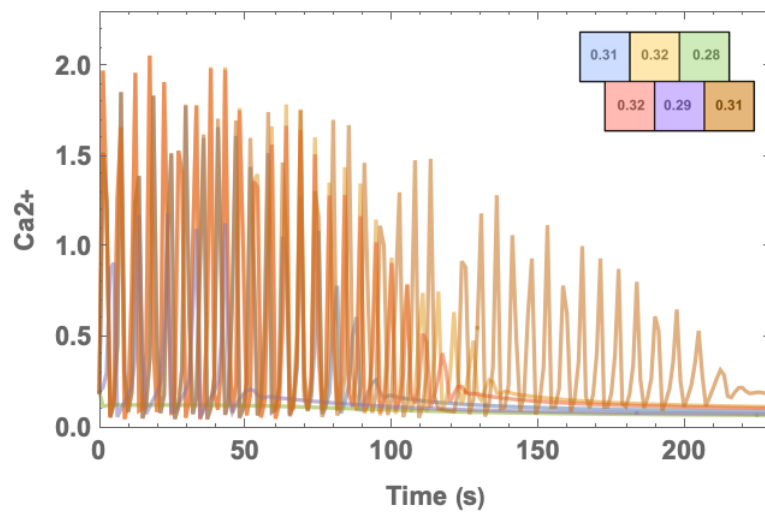
**Figure 4.** Enlarged  $\text{Ca}^{2+}$  dynamics before cessation of above cells.



**Figure 5.** Enlarged  $\text{Ca}^{2+}$  dynamics before cessation of above cells.



**Figure 6.** Enlarged  $\text{Ca}^{2+}$  dynamics before cessation of above cells.



**Figure 7.** Enlarged  $\text{Ca}^{2+}$  dynamics before cessation of above cells.